Connections Between Products and Contexts. Key Drivers for the Design of a Product

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– BULLETIN of ENGINEERING

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ACTA TECHNICA CORVINIENSIS
– BULLETIN of ENGINEERING
ISSN: 2067-3809 [CD-Rom, online]

Aims & Scope

General Aims:

ACTA TECHNICA CORVINIENSIS – BULLETIN OF ENGINEERING is an international and interdisciplinary journal which reports on scientific and technical contributions.

ACTA TECHNICA CORVINIENSIS – BULLETIN OF ENGINEERING publishes invited review papers covering the full spectrum of engineering. The reviews, both experimental and theoretical, provide general background information as well as a critical assessment on topics in a state of flux. We are primarily interested in those contributions which bring new insights, and papers will be selected on the basis of the importance of the new knowledge they provide.

Topical reviews in materials science and engineering, each including:

- *surveys of work accomplished to date*
- *current trends in research and applications*
- *future prospects.*

As an open-access journal ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering will serve the whole engineering research community, offering a stimulating combination of the following:

- *Research Papers - concise, high impact original research articles,*
- *Scientific Papers - concise, high impact original theoretical articles,*
- *Perspectives - commissioned commentaries highlighting the impact and wider implications of research appearing in the journal.*

ACTA TECHNICA CORVINIENSIS – BULLETIN OF ENGINEERING encourages the submission of comments on papers published particularly in our journal. The journal publishes articles focused on topics of current interest within the scope of the journal and coordinated by invited guest editors. Interested authors are invited to contact one of the Editors for further details.

Every year, in three issues, ACTA TECHNICA CORVINIENSIS – BULLETIN OF ENGINEERING publishes a series of reviews covering the most exciting and developing areas of engineering. Each issue contains papers reviewed by international researchers who are experts in their fields. The result is a journal that gives the scientists and engineers the opportunity to keep informed of all the current developments in their own, and related, areas of research, ensuring the new ideas across an increasingly the interdisciplinary field.

ACTA TECHNICA CORVINIENSIS – BULLETIN OF ENGINEERING exchange similar publications with similar institutions of our country and from abroad.

Audience:

Scientists and engineers with an interest in the respective interfaces of engineering fields, technology and materials, information processes, research in various industrial applications. It publishes articles of interest to researchers and engineers and to other scientists involved with materials phenomena and computational modeling.

About us:

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is an international and interdisciplinary journal which reports on scientific and technical contributions and publishes invited review papers covering the full spectrum of engineering.

Every year, in four online issues (fascicules 1 - 4), ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering [e-ISSN: 2067-3809] publishes a series of reviews covering the most exciting and developing areas of engineering. Each issue contains papers reviewed by international researchers who are experts in their fields. The result is a journal that gives the scientists and engineers the opportunity to keep informed of all the current developments in their own, and related, areas of research, ensuring the new ideas across an increasingly the interdisciplinary field.

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering has been published since 2008, as an online supplement of the ANNALS OF FACULTY ENGINEERING HUNEDOARA – INTERNATIONAL JOURNAL OF ENGINEERING.

Now, the ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is a free-access, online, international and multidisciplinary publication of the Faculty of Engineering Hunedoara.

Coverage:

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is a good opportunity for the researchers to exchange information and to present the results of their research activity. Scientists and engineers with an interest in the respective interfaces of engineering fields, technology and materials, information processes, research in various industrial applications are the target and audience of ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering. It publishes articles of interest to researchers and engineers and to other scientists involved with materials phenomena and computational modeling.

The journal's coverage will reflect the increasingly interdisciplinary nature of engineering, recognizing wide-ranging contributions to the development of methods, tools and evaluation strategies relevant to the field. Numerical modeling or simulation, as well as theoretical and experimental approaches to engineering will form the core of ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering's content, however approaches from a range of environmental science and economics are strongly encouraged.

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering appear in four issues per year and is open to the reviews, papers, short communications and breakings news inserted as Scientific Events, in the field of engineering.

General Topics:

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- MECHANICAL ENGINEERING
- METALLURGICAL ENGINEERING
- AGRICULTURAL ENGINEERING
- CONTROL ENGINEERING
- ELECTRICAL ENGINEERING
- CIVIL ENGINEERING
- BIOMEDICAL ENGINEERING
- TRANSPORT ENGINEERING

ECONOMICS
- AGRICULTURAL ECONOMICS
- DEVELOPMENT ECONOMICS
- ENVIRONMENTAL ECONOMICS
- INDUSTRIAL ORGANIZATION
- MATHEMATICAL ECONOMICS
- MONETARY ECONOMICS
- RESOURCE ECONOMICS
- TRANSPORT ECONOMICS
- GENERAL MANAGEMENT
- MANAGERIAL ECONOMICS
- LOGISTICS

COMPUTER AND INFORMATION SCIENCES
- COMPUTER SCIENCE
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- ANALYTICAL CHEMISTRY
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- MATERIALS SCIENCE & METALLOGRAPHY
- POLYMER CHEMISTRY
- SPECTROSCOPY
- THERMO-CHEMISTRY

EARTH SCIENCES
- GEODESY
- GEOLOGY
- HYDROLOGY
- SEISMOLOGY
- SOIL SCIENCE

ENVIRONMENTAL
- ENVIRONMENTAL CHEMISTRY
- ENVIRONMENTAL SCIENCE & ECOLOGY
- ENVIRONMENTAL SOIL SCIENCE
- ENVIRONMENTAL HEALTH

BIOMECHANICS & BIOTECHNOLOGY
- BIOMECHANICS
- BIOTECHNOLOGY
- BIOMATERIALS

MATHEMATICS
- APPLIED MATHEMATICS
- MODELING & OPTIMIZATION
- FOUNDATIONS & METHODS

Invitation:

We are looking forward to a fruitful collaboration and we welcome you to publish in our ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering. You are invited to contribute review or research papers as well as opinion in the fields of science and technology including engineering. We accept contributions (full papers) in the fields of applied sciences and technology including all branches of engineering and management.

Submission of a paper implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis) that it is not under consideration for publication elsewhere. It is not accepted to submit materials which in any way violate copyrights of third persons or law rights. An author is fully responsible ethically and legally for breaking given conditions or misleading the Editor or the Publisher.

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Editorial & Advisory Board

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Review process & Editorial Policy

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is dedicated to publishing material of the highest engineering interest, and to this end we have assembled a distinguished Editorial Board and Scientific Committee of academics, professors and researchers.

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering publishes invited review papers covering the full spectrum of engineering. The reviews, both experimental and theoretical, provide general background information as well as a critical assessment on topics in a state of flux. We are primarily interested in those contributions which bring new insights, and papers will be selected on the basis of the importance of the new knowledge they provide.

The editorial policy of ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering is to serve its readership in two ways. Firstly, it provides a critical overview of the current issues in a well-defined area of immediate interest to materials scientists. Secondly, each review contains an extensive list of references thus providing an invaluable pointer to the primary research literature available on the topic. This policy is implemented by the Editorial Board which consists of outstanding scientists in their respective disciplines. The Board identifies the topics of interest and subsequently invites qualified authors. In order to ensure speedy publication, each material will be report to authors, separately, thought Report of the Scientific Committee. For an overview of recent dispatched issues, see the ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering issues.

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering encourages the submission of comments on papers published particularly in our journal. The journal publishes articles focused on topics of current interest within the scope of the journal and coordinated by invited guest editors. Interested authors are invited to contact one of the Editors for further details.

The members of the Editorial Board may serve as reviewers. The reports of the referees and the Decision of the Editors regarding the publication will be sent to the corresponding authors.

The evaluated paper may be recommended for:

- *Acceptance without any changes – in that case the authors will be asked to send the paper electronically in the required .doc format according to authors' instructions;*
- *Acceptance with minor changes – if the authors follow the conditions imposed by referees the paper will be sent in the required .doc format;*
- *Acceptance with major changes – if the authors follow completely the conditions imposed by referees the paper will be sent in the required .doc format;*
- *Rejection – in that case the reasons for rejection will be transmitted to authors along with some suggestions for future improvements (if that will be considered necessary).*

The manuscript accepted for publication will be published in the next issue of ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering after the acceptance date.

ACTA TECHNICA CORVINIENSIS – Bulletin of Engineering accept for publication unpublished manuscripts on the understanding that the same manuscript is not under simultaneous consideration of other journals. Publication of a part of the data as the abstract of conference proceedings is exempted.

All the authors and the corresponding author in particular take the responsibility to ensure that the text of the article does not contain portions copied from any other published material which amounts to plagiarism. We also request the authors to familiarize themselves with the good publication ethics principles before finalizing their manuscripts.

Manuscripts submitted (original articles, technical notes, brief communications and case studies) will be subject to peer review by the members of the Editorial Board or by qualified outside reviewers. Only papers of high scientific quality will be accepted for publication. Manuscripts are accepted for review only when they report unpublished work that is not being considered for publication elsewhere.

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The Editor and editorial board members do not receive any remuneration. These positions are voluntary.
We are very pleased to inform that our journal ACTA TECHNICA CORVINIENSIS – BULLETIN of ENGINEERING is going to complete its four years of publication successfully. In a very short period it has acquired global presence and scholars from all over the world have taken it with great enthusiasm. We are extremely grateful and heartily acknowledge the kind of support and encouragement from you.
ACTA TECHNICA CORVINIENSIS – BULLETIN of ENGINEERING is seeking qualified researchers as members of the editorial team. Like our other journals, ACTA TECHNICA CORVINIENSIS – BULLETIN of ENGINEERING will serve as a great resource for researchers and students across the globe. We ask you to support this initiative by joining our editorial team. If you are interested in serving as a member of the editorial team, kindly send us your resume to redactie@fih.upt.ro.

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Content of FASCICULE 4 [OCTOBER–DECEMBER]

ABSTRACT: *This paper presents the assessment of building security system and active fire protection system in administration building. Building is a structure that gives protection to human. A building needs to protect human from extreme weather and danger created by human. Apart from giving us protection; building gives us privacy as well. Our generation is different from the previous generations. The environment is now more dangerous than the past. People can get hurt or killed even in the house. Other than building security system, an active fire protection system is also crucial to ensure that the occupants in the building are protected adequately against fire. Fire can spread to a wide area in seconds if we do not have fire protection system to prevent the fire from spreading. Administration building is a building accommodating ten to hundreds of people. It needs a proper security system to monitor and control the flow of people. Vandalism and burglary can happen easily without a proper and effective security system. Besides that, since an administration building accommodates many people, therefore, its active fire protection system needs to comply with Uniform Building By-Law (UBBL) of Malaysia.*

ABSTRACT: *A transformation is a sequence of states through which a thermodynamic system when its parameters vary from baseline values to those in the final state. All thermodynamic properties at a time system are the system state. State parameters are all measurable physical quantities that characterize the unique thermodynamic state of the system. A substance is characterized, as we know, the state variables: pressure, volume, temperature, etc. At a certain amount of substance, these three variables are a well established interdependence of thermal equation of state. To ease the study of gases have made some considerations that lead to a relatively simple model study. This so-called ideal gas, the molecules are considered material points, and the interaction forces between molecules are void. It is obvious that this case can not be met in practice, but the considerations made on this system can be extended with some corrections and within certain limits, the real gas. The application is done using Microsoft Access and was made for students to be able to easily own knowledge about the transformations simple ideal gas of this gas. Students can calculate and make conclusions can be drawn, however this program is not meant to replace the teacher but to offer a tool to study in classes, the theory that parties are not very many. The menu is affordable, intuitive and helpful. For a better understanding of the application is structured in four parts.*

ABSTRACT: *With conventional noncircular grinding the uneven shape of workpieces is created by pendular movement of a round grinding disk. In contrast with rpm-synchronous noncircular grinding the workpiece is machined with an unround grinding disk. In process the workpiece and the tool are turning with a certain rpm-ratio. With this special method it is possible to machine several types of unround shapes (e.g. all cams of a camshaft) with just one step of positioning. This paper is focused on basic research in rpm-synchronous noncircular grinding. It shows which possible applications this method offers and also their limits.*

ABSTRACT: *The sawing regimes of some woodworking machines have been analyzed, and it has been found out that there are cases when the load of their cutting mechanisms can be increased. The period of operation for which these regimes have been established has been analyzed. When there are lower requirements for the quality of the sawn surfaces, it has been recommended to develop the sawing regimes step by step, for the whole period between two sharpenings of the cutting blades. This allows making a better use of the cutting power of the sharp cutting blades.*

ABSTRACT: *Electric, hydraulic and pneumatic drives are widely used in industrial environment. In robotics different types of pneumatic actuators - e. g. cylinders and pneumatic motors - can be found commonly to date. A less well-known type is that of the so-called pneumatic artificial muscles (PAMs). Different designs have been developed, but the McKibben muscle is the most popular and is made commercially available by different companies, e. g. Fluidic Muscle manufactured by Festo Company. Many researchers have investigated the relationship of the force, length and pressure to find a good theoretical approach for the equation of force produced by pneumatic artificial muscles. This paper presents the static model of PAM and our newest model for the force generated by Fluidic Muscle. The accuracy of this new model for the hysteresis loop is analysed by mathematical methods of statistics.*

ABSTRACT: *The main objective of this study was to compare human and robot performances for a simple dismantling operation by conducting a time study and cost evaluation. The dismantling task consisted of separation of a battery from a mobile phone (MP). Two work stations were analyzed and compared, one robotic and one human. The robotic work station was schematically designed and evaluated in simulation in order to achieve the dismantling times and costs. The human dismantling work station was tested in laboratory conditions. On the basis of calculating the average costs of dismantling of the battery for one mobile phone we can conclude that in the assumed conditions the robotic work station is a more efficient dismantling work station (1.20 eurocent per MP), and the human dismantling work station is less efficient.*

ABSTRACT: *In this paper we have investigated Microstrip line fed semi circular printed monopole antenna, which is basically printed microstrip antenna with etched ground plane for UWB applications. In particular we have simulated circular patch monopole antenna and then after etched some part of the radiating patch in order to make semi circular antenna with good performance for UWB communication. While doing simulation study, a simple rectangular microstrip line is used for feeding the printed monopole antenna. Finally the simulated antenna is having frequency bandwidth under -10dB return loss is ranging from 2.8 GHz to 15 GHz. This semi circular printed monopole antenna works well for the whole UWB frequency band 3.1-10.6GHz.*

ABSTRACT: *According to the recent economic situation, the actual business model will not be sustainable for a long time. In this paper we want propose a design methodology, which leads the possibility to influence people behaviours through the products. The aim of this paper is to underline the role of the designer, as director of the process, in order to coordinate involved actors and actions. This approach suggests a result, namely a product, which uses the local resources preserving material and cultural tradition and furthermore understanding the relationships between the costumer and his territory. The link between the product and its context defines a "surplus value" which characterizes the design process as "sustainable". According to that, the final aim should be a "customised product" defined through a muldisciplinary approach, where the role of the designer is creating a dialogue among all the different actors involved in the definition of the product.*

ABSTRACT: *The aim of this article is basic overview of actual situation in principles of industrial robot programming and introduction of simple extended remote control principle. Remote control is realized by serial communication port and software in C# programming language. It is used for positioning articulated robot with 5 DOF Mitsubishi RV-2AJ. These industrial robots are usually used for student education to teach robot programming languages. Introduced software provides simple interface to robot program only by mouse control or import trajectory of movement from external position list file. We can set two movements types PTP and CP interpolated linear movement. Remote control software of robot can be used for many special task; we tested reliability by drawing equipment.*

ABSTRACT: *There is poor information in the literature written on this theme, regarding the re-utilization without regenerating operations of the moulding sands prepared with synthetic resins. In practice, these methods have a lot of difficulties regarding the separation of moulding sands with organically bonding agents in comparison with the sands prepared with non-organically agents. The re-utilisation of moulding sands based on resins without technological regenerating processes is not to be applied in the practice of the preparation with resins. Therefore is intended a re-utilisation of these moulding sands, with non-organically bonding agents (clay), replacing thus, partly, with new sand. The industrial foundry practice showed that this method could be applied with good results to any type of mould based on the organically bonding agents.*

ABSTRACT: *During the last years, the self-cleaning surface structures of lotus flowers have been reproduced in numerous ways on textiles or paints and other surfaces to reduce sensitivity against pollution which, in turn, allows a reduction of water- and detergent consumption. Unfortunately, some of these techniques suffer from wear or are potentially biohazardous due to the small particle size. We present a method to produce nanostructures on surfaces by multi-beam interference of ultra-short laser pulses. Intensity distributions of various configurations have been simulated and show the feasibility of the suggested process.*

ABSTRACT: *This article describes the use computer supported systems in practise. CA systems supported activities in all stages of production – from design region and construction, through production and finally mounting, storage and expedition. These systems represent very effective tool in region before-production and production stages in this time. They represent tool which can increase company´s market position.*

ABSTRACT: *This paper presents the results of a study demonstrating an approach for using aerodynamic coefficients for a missile with grid fins. A grid fin is an unconventional lifting and control surface that consists of an outer frame supporting an inner grid of intersecting planar surfaces of small chord. The calculations were made at a mach number of 0.2 and angle of attack 0° for a missile with grid fins. The simulations were also successful in calculating the flow structure around the fin in the separated-flow region at the higher angles of attack. This was evident in the successful calculation of the nonlinear behavior viscous computational fluid dynamic simulations to calculate the flow field and for that fin, which showed negative normal force at the higher angle of attack. The effective angle of attack is negative on either part of the entire top grid fin for the higher angle of attack. The modeling of unconventional grid fin missile is done in CAD software called CatiaV5. The meshing of geometry is in a pre processor called Gambit. And the solving and post processing is done in a solver called Fluent.*

ABSTRACT: *The important aspect related to both banks' and other financial institutions' a performance is the analysis of the clients' obligations fulfillment through applying various mathematical models. Furthermore, the main purpose of the models is estimation of the possibility of default (default rate). Moreover, it is important for the users of the model to posses data related to possibilities' accuracy. There are various ways for testing the accuracy related to the default possibilities, and in this paper the minimal number of observations will be presented. Thus, simple statistical operations will be presented, important for gaining a minimum level related to sample size. Moreover, the paper will point out that for determining the minimum size of the sample, the absence of correlation among data is essential. If the correlation is present, the minimum level of accuracy of the sample size could be altered, representing the important conclusion of this paper. Furthermore, if there is fixed sample, this approach allows minimum difference between estimated and actual empirical default rate. Finally, the cases indicating inaccurate minimum level of the sample size will be shown as well.*

ABSTRACT: *After recent research activities focused on water jet technology and abrasive water jet process parameters optimalization, it is necessary to stress attention to aspects which have been out of main research stream but they are very important for understanding cutting process physical principles, improving production systems operability and cutting quality improving. The paper deals with a research of technology parameters fluctuation effect on AWJ production system technology head vibration generation during technical ceramics cutting production process. The submitted paper points at possible sources of undesirable vibrations: pump pressure, which can be a reason of reliability and AWJ technology production systems lifetime reduction, and of abrasive nozzle wear increasing as well as of cutting edge quality reducing. New knowledge submitted in this paper was formulated on the base of performed experiments and graphic relations. On the base of gained relations, conclusions, recommendations and contributions for scientific activity and business practice were formulated as well.*

ABSTRACT: *Foundry technology is developing in Nigeria and other developing countries in the world; therefore, there are high demands for raw materials. New materials continue to be developed to meet special requirements which require special processing in order for their properties to be effectively utilized. High cost of imported binders has generated great interest in characterizing the locally available materials, therefore necessitating the need to look into domestically available binders that will meet the criteria for manufacturing, that is, reliability, cost, toxicity and availability; these are rationale behind this work. In this study, efforts were made to produce inexpensive and efficient binders from locally sourced materials (starch, and rubber latex) in Nigeria for the use of foundry cores. This was carried out by blending the locally sourced materials: starch-rubber latex (1:2) with silica sand, and water in different proportions while bentonite was used as control. Binders from various blend compositions were used to make core samples, and each core sample produced was subjected to the following mechanical tests: green compressive strength, dry compressive strength, collapsibility, and surface hardness. The blending caused great improvement in the mechanical properties of the core samples produced. The dry compressive strength values for all the core samples produced were greater than the corresponding green compressive strength values. The collapsibility decreased with increasing proportions of blended binders while the surface hardness values for starch-rubber latex binder cores were higher than for the core samples from bentonite binder.*

ABSTRACT: *The pollution monitoring is a necessary part of any environmental management system, being the basis for a fully informed decision-making process and developing environmental management strategies. To ensure a thorough decision, it is essential to be fully convinced that the measurements reflect the reality. The discharges into the environment from the major sources are pursued in a general monitoring process of the significant sources of pollutants within catchments. The objectives also include monitoring systems, optimization issues, verification and compliance with legislative requirements, such as allowable emission limits. We have analyzed the quantities of metallic elements (Mn, Ni, Zn, Cr, Cu and Pb) found in the wastewater from the areas of steel works and rolling mills, and we performed a calculation of pollutants in water, based on the measurements made (according to Romanian standards) between 2008-2010. The monitoring plans are designed and implemented to collect data about the water quality and the significant discharges of pollutants from the major sources. In this paper, we present the assessment of emission impact on waters, based on a case study conducted on the company TMK Reşiţa (Romania). The environmental plan provides the necessary works for reducing the emissions of pollutants in soil and groundwater, these works being executed by the company. Likewise, the drillings required for groundwater monitoring on the company site and the slag dump have been made. The quality assurance plan formulated the arguments that led to the establishment of the number of sampling points, the location of these points, the sampling frequency, the equipment and methods of sample collection.*

ABSTRACT: *Gas dynamics is synonymous with aerodynamics when the gas field is air and the subject of study is flight. It is highly relevant in the design of aircraft and spacecraft and their respective propulsion systems. Progress in gas dynamics coincides with the developments of transonic and supersonic flight. As aircraft began to travel faster, the density of air began to change, considerably increasing the air resistance as the air speed approached the speed of sound. Most phenomena in real world are described through nonlinear equations and these kinds of equations have attracted lots of attention among scientists. A wide range of nonlinear equations do not have a precise solution, so analytical methods have been used to handle these equations. Many different new methods have recently presented some techniques to eliminate the small parameter. In this paper, a new analytical technique called the Reconstruction of Variational Iteration Method (RVIM) is suggested for finding the exact solution of gas dynamic equation. The solution procedure explicitly reveals the complete reliability and simplicity of the proposed algorithm. The RVIM technique has been successfully applied to many nonlinear problems in science and engineering. All of these verify the great potential and validity of the RVIM technique in comparison with Variational Iteration Method (VIM) for strongly nonlinear problems in science and engineering. The results reported here provide further evidence of the usefulness of RVIM for finding the analytic and numeric solutions for the linear and nonlinear diffusion equations and, it is also a promising method to solve different types of nonlinear equations in mathematical physics.*

ABSTRACT: *This paper presents the technical solutions of an installation for completion of drying hay up to the humidity of 17 ... 18%, by ventilation with cold air or hot air. The installation is constructed from assemblies developed within a modular structure so that users can configure their drying installation according to the needs of the farm. Specific to the installation is the solar panel constructed from a number of solar collectors Nc made of light materials, painted inside with paint or solar lacquers of black color for having an as higher as possible absorption degree of the solar radiation. For the sizing of the drying installations depending on the needs of the feedingstuffs farm were developed tables based on the interdependence of drying platform dimensions, the necessary flow to the fan and the amount of conserved forage material.*

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CONNECTIONS BETWEEN PRODUCTS AND CONTEXTS – KEY DRIVERS FOR THE DESIGN OF A PRODUCT

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ABSTRACT: *According to the recent economic situation, the actual business model will not be sustainable for a long time. In this paper we want propose a design methodology, which leads the possibility to influence people behaviours through the products. The aim of this paper is to underline the role of the designer, as director of the process, in order to coordinate involved actors and actions. This approach suggests a result, namely a product, which uses the local resources preserving material and cultural tradition and furthermore understanding the relationships between the costumer and his territory. The link between the product and its context defines a "surplus value" which characterizes the design process as "sustainable". According to that, the final aim should be a "customised product" defined through a muldisciplinary approach, where the role of the designer is creating a dialogue among all the different actors involved in the definition of the product.*
KEYWORDS: *sustainability, territory, relationships, muldisciplinary, industrial product*

BACKGROUND

Since the second half of the last century the scientific community was able to document, with an increasing deepening, the dramatic effects which human beings' activities wield on natural systems to solve their needs [1].

According to that, the Living Planet Report 2010 [2] pointed out that the ecological footprints of countries are causing an increasingly impressive environmental deficit.

Every day the International scientific community describes the effects of the human impact on the earth's natural system that still remains the only source we have and that is the base of the entire world economy and our wellness [3].

The actual economic and financial crisis is a huge and serious problem, but our ecological deficit is much more worrying than any other crisis we went through, also because environmental problems are probably one of the biggest reasons of the increasing of the economic crisis.

The world economy has grown with a massive rate in the last sixty years. The gross world product (GWP), has reached 69,000 billion of dollars in 2008, and already in that year there was a soft deflection in the annual growing percentage, due to the current economic crisis [4].

In the 1950 the gross world product was approximately of 6,600 billion of dollars and, since then, in sixty years we have almost tenfold.

By comparing these figures, it seems not plausible believe in a continuous and endless growth of the GWP.

As pointed out by the economist Jean Paul Fitoussi in his speech at the East-Forum 2010 in Rome, the sustainability is a complex concept formed by economical, social and environmental dimensions.

These three aspects have to be considered in a complementary manner, they cannot be in competition, and so it is not possible take into account only the economical part [5].

According to that, the economical and environmental crisis can be seen as two aspects of the same phenomenon.

Thinking about the nature, it's interesting underline as, contrary to our economic model, all the earth's natural systems can renew themselves, generating life.

According to that, the ecologist Eugene Odum called the natural systems: life-support systems. He also described the whole earth as an ecological unit, formed by living and non-living parts, which together interact to form a stable entity [6, 7].

Our dominant culture leads us to neglect, and often to ignore, processes and functions performed by the nature. Each time we use it for our welfare, we probably weak or damage its resistance and resilience, and we difficulty understand that, in this way, we are reducing our chances of development for the future.

As ecologists have affirmed, humanity is closely dependent to processes, features and services provided by natural systems.

The humanity-health is therefore linked to the health of ecosystems and biodiversity, which are the basic constituents of natural systems.

As human beings, we are also a component of natural systems: without them we would not be able to evolve, and survive.

Despite this, people are heavily altering functioning and diversity of ecosystems: this is reflected in significant impacts on wellbeing, economy, wealth, and happiness of society. Because of that, urgent and concrete actions to reverse the negative trend are required.

The challenge we face today has very significant proportions and the only hope we have to win is to involve everybody.

It is humanity's duty figure out how the current 7 billion of population (the number is increasing and will

be approximately close to 10.6 billion in 2050) can live in this planet with an appropriate lifestyle, without causing the devastation of natural systems [8] (United Nations, 2010).
The aim of this paper is showing a possible way for facing the crisis by starting from a co-operative approach in the product's design process.

METHODOLOGY

This paper is based on the application of the Systemic Design methodology, namely with the acronym SD further in this paper. This approach underlines the importance of making better use of material and energy flows, in order to model our production and energy systems looking at the nature's rules [9].
This concept is also asserted in principles of Industrial Ecology theory: effluents of one process serve as the raw material for another process; the industrial ecosystem would function as an analogue of biological ecosystems [10].
Furthermore, according to the SD methodology, material and energy flows should be opened, in order to decrease environmental impact and resources depletion.
In particular, according to its principles (Figure 1), the SD:

- *considers the waste of a system, namely output, as resources, namely input, for another system*
- *argues that each system starts from relationships among its constituent parts*
- *underlines that each system should be self-sufficient as much as possible, in order to naturally led to balance, and furthermore to preserve, itself alone*
- *assumes the relevance of the local context as resource base*
- *takes into account, during the design process, the environmental, social, cultural and ethic context as well as the subject of the project.*

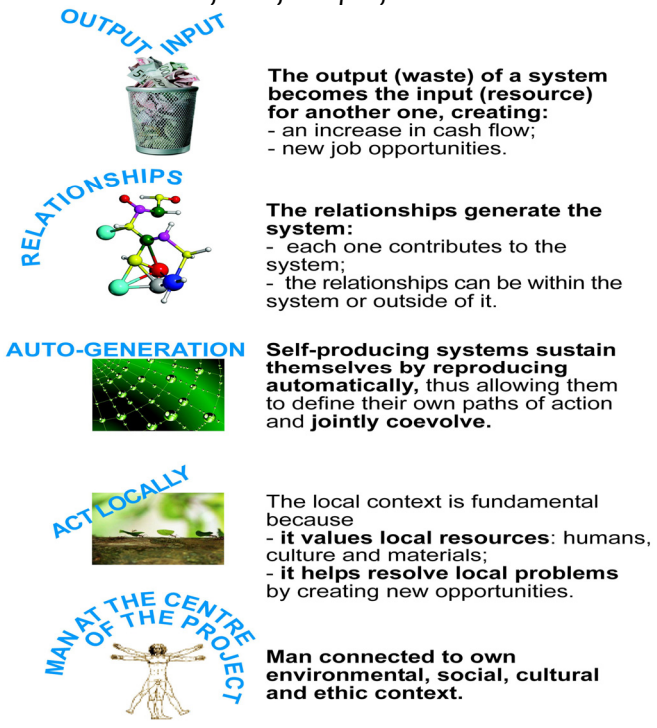

Figure 1: Systemic Design principles

In this paper the applied methodology stresses the relevance of connections and relationships among the elements of a system, which consequently underline the importance of a multidisciplinary approach in the design process.
According to that, the inter-connections among system's components are important as well as the dialogue among the participants in the process.
Therefore, a model based on systemic principles takes into account exchanges of material and energy among the involved elements; this is why it is possible to say that it is strictly influenced by the rules of the natural system.
It is a matter of fact that every natural system can be described with flows. In Nature nothing evolves in a static way: everything is linked and interacts with its own surrounding. Indeed, the design challenge for our century is finding the way to link as much as possible the elements of a system, trying to find a solution according to them [1].

RESEARCH AIM

The aim of the research is think about the consequences of the human's daily activities on the territory.
By starting from that concept and focusing the study on the design process, it is really important take into account strong relationships among human beings and their surroundings.
During a historical evolution, a territory is defined in time and space by behaviour of its inhabitants and its local peculiarities.
Hence, each specific geographical area is defined by different resources, which during centuries have been used from human beings in order to reach their needs.
So that, the inhabitants of different contexts have developed a specific "know-how", strictly connected with defined territories.
Besides, during years the human abilities in doing things have lead a "material culture" characterized by social and cultural aspects dependent on territorial qualities.
Summarizing, a design process based on the local characterizations, has to take into account different aspects of a territory, which can be summarized in: available resources, "know-how" and "material culture" [9](Figure 2).

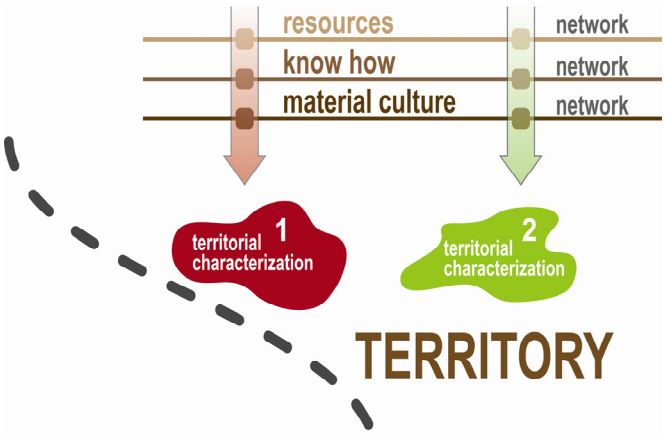

Figure 2: Local resources, know-how and material culture define the characterization of a territory

Because of the suggested approach promotes the interdependency between the product and its context, it is possible to forecast some relevant effects which influence the territory in different fields (Figure 3).

- *Economy: the use of territory's resources leads the growth of the local economy.*
- *Culture: thanks to this approach, each territory will be defined by different expertise, strictly related to the "material culture" of its inhabitants.*
- *Market: the preference for of a small-scale economy will avoid problems caused by a large-sale logistic.*
- *Environment: a production method based on the local available resources will produce fewer products with high quality, without affect the environmental balance.*
- *Quality: the quality-level of a product will be guaranteed by its local-identity.*

Moreover the application of this method will consequently enhance the wellbeing level of a place and its inhabitants.

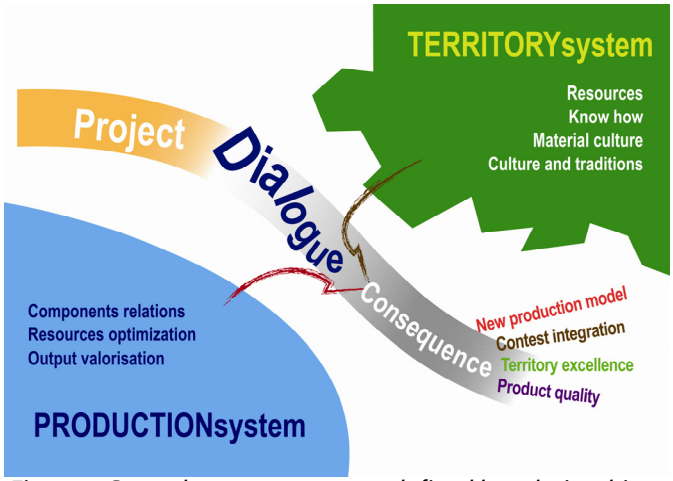

Figure 3: Several consequences are defined by relationships between the product and its territory

CONCLUSIONS

In this paper the authors have described a design process based on the strictly relationships between the product and its surroundings, and furthermore the possibility of guiding customers toward a sustainable approach, in term of economical, social and environmental values.

By starting from the natural systems' concept of the interaction among the elements of a system, it becomes clear that a product has to be related to its territory, in order to use the available resources and to preserve its "know-how" and culture.

The customer, who hopefully will understand the relevance of connections between the product and its territory, will be also able to appreciate these characteristics as a "surplus value" of the product itself.

The inter-dependency between the product and its surroundings, defined by multiple social, cultural, economical and environmental factors, point out that every earth's zone define as many products.

Consequently, by applying a systemic approach that considers the product as a "system" connected with several other related elements, a "customized product" would be preferable instead of a "standard one".

A systemic and holistic approach like the SD methodology, is based on the co-operation among the actors of the process. Because of that, the designer should take the role of expertise's coordinator, in order to show common points among the elements of the system; to point out possible hidden connections among the product and the other related systems and furthermore to explain interconnections among the participants' expertise.

Thanks to a systemic approach, the designer is able to show interactions among components and also wide the boundaries of a product that will be influenced by several factors, from social to environmental areas (Figure 3).

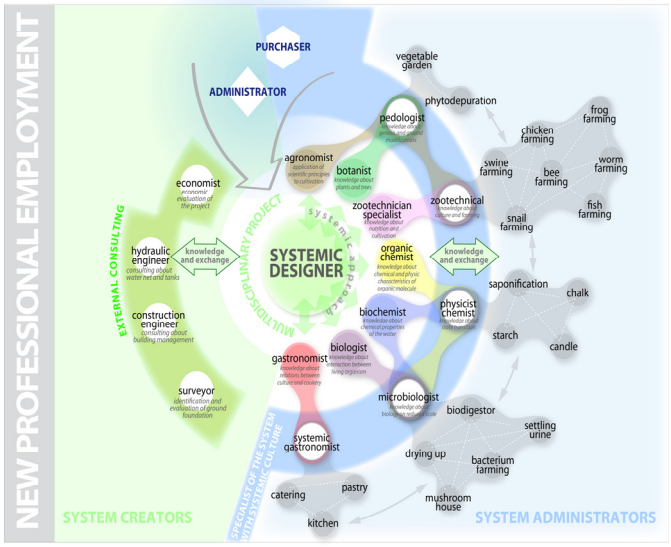

Figure 3: The role of the systemic designer, case study of a jail in Turin, Italy. Project of some students of the Master course "Systemic Design", Politecnico di Torino, 2011-2012

The straightness of the social, cultural and environmental factors shift the industrial approach from a "linear model", characterized by the competition among parts, to a "systemic model", defined by the co-operation among stakeholders.

In this process multiple disciplines and seemingly unrelated aspects of design are integrated in a manner that permits synergistic benefits to be realized [11].

FUTURE RESEARCH

We introduced a method for the development of products that are highly connected with the local characteristics.

However the practical-aspects have not been analyzed in this paper. Because of this reason, possible future developments can be:

- *The analysis of the role of the consumer, which should be educated in order to appreciate the "surplus value" of a product connected to the territory.*
- *The development of a "consumption model", based on the valorization of local values and territorial aspects.*

- The application of this methodology in a case study, in order to study the real consequences that this approach causes to the products' design process.

REFERENCES

[1.] Pauli G., The Blue Economy: 10 anni, 100 innovazioni, 100 milioni di posti di lavoro, Italia, Edizioni Ambiente, Milano, 2009.

[2.] Wwf, Living planet report 2010. Great Britain, Wwf International, Global Footprint Network, Water Footprint Network e Zoological Society of London, London, 2009.

[3.] Corvalan C., Hales S., McMichael A., Butler C., et al., Ecosystem and Human Well-being: Health Synthesis: A Report of the Millenium Ecosystem Assessment, World Health Organization, France, 2005.

[4.] Worldwatch Institute, Vital Signs 2010, Norton e International Monetary Fund, World Economic Outlook, IMF, 2009.

[5.] Fitoussi, http://wn.com/Jean_Paul_Fitoussi_3__east_forum_'09. published on 2010

[6.] Odum, E. P.. Fundamentals of Ecology, United States, Saunders, Philadelphia, 1971.

[7.] Yeang K. Ecodesign - a manual for ecological design, Wiley-Academy, a division of John Wiley & Sons, Great Britain, 2006.

[8.] United Nations, Department of Economic and Social Affairs, World Population to reach 10 billion by 2100 if Fertility in all Countries Converges to Replacement Level, 2011, press release on www.unpopulation.org

[9.] Bistagnino, L., Systemic Design - 2nd edition, Italia, Slow Food Editore, Bra (CN), 2011.

[10.] Frosh R., Gallopoulos E., Strategies for Manufacturing, Scientific American, 261 (1989), 144-152

[11.] Charles J. K., Sustainable construction. Green building design and delivery, New Jersey, John Wiley & sons, Inc., 2008.

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